



## Seminar/Talk

# Quantitative stochastic homogenization of non-linear problems arising in mechanics

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ISTA

Host: Laszlo Erdős, Jan Maas

The aim of this talk is to present some recent developments in the theory of quantitative stochastic homogenization of non-linear problems arising in mechanics. In a first part, I will discuss a quantitative homogenization theory for non-linear elliptic PDEs of  $p$ -Laplacian, that can be seen as the Euler-Lagrange equation of the energy of an elastic body with random microstructure (in the case of small deformations). In particular, I will present two results : optimal rates for the convergence towards the homogenized problem; and a work in progress concerning a large-scale regularity theory for such non-linear elliptic PDEs. This is based on joint works with Antoine Gloria and Mathias Schffner. In a second part, I will move forward variational problems arising in fracture mechanics that are described by Griffith-type energies. Based on a work by Dal Maso, Scardia and Zeppieri that identifies qualitatively the effective fracture toughness by means of a cell-formula; I will present a recent result that establishes rates for the convergence of the cell-formula towards the effective quantity. This is based on a joint work with Antonio Agresti and Julian Fischer.

**Monday, March 25, 2024 03:45pm - 04:45pm**

Central Bldg / O1 / Mondi 2a (I01.O1.008)



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